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CONTROL FOR AN EXCIMER EMITTER

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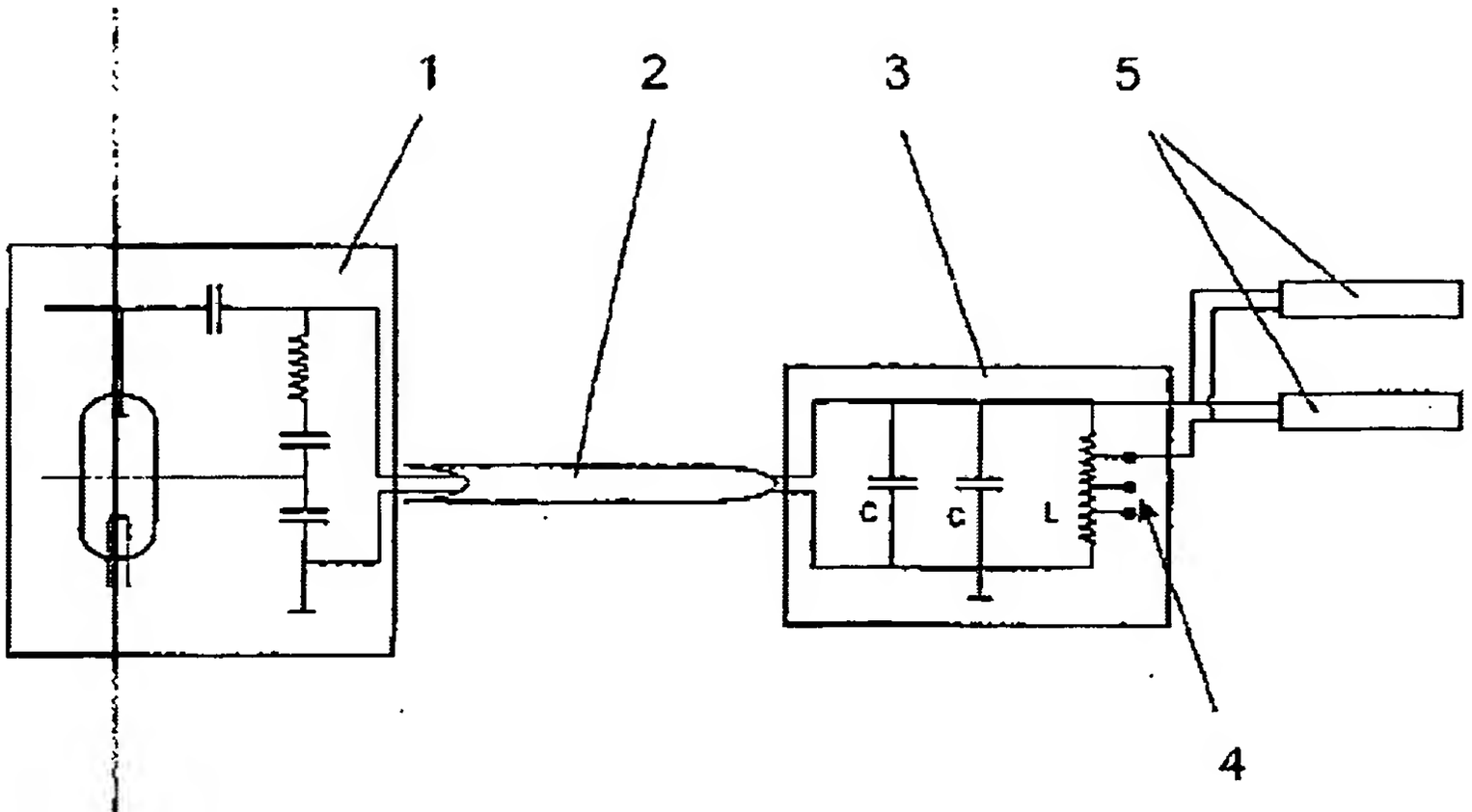

(57) Abstract: The invention relates to a control for an excimer emitter, particularly for the dryer in a printing press, comprised of an HF generator that is connected on the output side to an excimer emitter. The aim of the invention is to improve the design of a control of this type for an excimer emitter as to enable a higher UV intensity of radiation. To this end, the invention provides that: the HF generator (1) is provided in the form of a tube-type generator with a feedback; the output of the HF generator (1) is connected to the input of a working circuit (3) comprising a capacitor (C) and an inductive resistor (L), and; the excimer emitter (5) is connected to the output of the working circuit (3).

Patent application

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Description

The invention concerns a control for an excimer emitter according to the preamble of Claim 1.

State of the art

UV driers are used both in sheet-fed and web-fed printing presses. Traditional UV driers are designed as mercury discharge lamps. The disadvantage with such UV driers is that with these broad-band radiating lamps, a relatively large amount of ozone is formed, which must be suctioned off and conducted to the outside. Special UV lamps for driers are excimer emitters, which emit a monochromatic UV radiation. In actual practice, emitters are frequently used here, which emit a wavelength of 308 nm. An advantage of such an emitter is that a heating of the paper does not take place, since the radiation does not contain any IR fractions. With a wavelength of 308 mn [sic; nm], ozone formation does not take place either. There is also a better utilization of the electrical input power for the drying process.

An excimer emitter essentially consists of a coaxially built capacitor, between whose electrodes, there is a gas mixture, which can be ignited by an electrical discharge. Such a gas mixture is, for example, xenon, a chlorine compound, and argon as the carrier gas. During the gas discharge, molecules XeCl*, which are excited for a short term, are hereby formed. These excited molecules emit a wavelength of 308 nm.

The coaxial walls of the gas space are formed by quartz tubes, on which interior or exterior electrodes are placed. Provision may hereby be made so that the interior and another exterior tube respectively receive a throughflow of cooling water.

To excite the short-lived molecules, a barrier discharge in the gas space and in the dielectric quartz is required. This takes place by means of HF voltages with amplitudes of 2 to 10 kV and frequencies of 100 to 1000 kHz. If the high voltage, which is applied on the discharge screws, exceeds the breakdown voltage of the gas, a discharge current, which produces excimer molecules and causes light emission, flows. The current flow, however, is interrupted after a very short time (nanoseconds), because the dielectric quartz is charged. That leads to a momentary reduction of the electrical field strength in the discharge gap and interrupts the current flow. To produce the required HF voltages, HF generators are used with known excimer emitters, which have end stages with ferrite transformers. It is precisely the transmission characteristics of the ferrite material which limits both the frequency and the HF output of such generators. In order to use excimer emitters in high-speed sheet-fed offset printers, illumination strengths are required at the level of the stock of more than 300 mW/cm^2. Such high-output excimer emitters in the range of wavelength 308 nm are not available, however, with ferrite transformers. From DE 42 38 388 C2, an electronic circuit arrangement for the control of an excimer emitter by means of a high-voltage transmitter is known.

Goal of the invention

The goal of the invention under consideration is to expand a control for an excimer emitter, in accordance with the preamble of Claim 1, in such a way that a higher UV radiation strength can be attained.

This goal is attained by the characterizing feature of Claim 1. Refinements of the invention can be deduced from the subordinate claims.

Examples

In accordance with the invention, provision is made so that the control of the excimer emitter takes place by means of an especially adapted HF generator, which is designed as a self-exciting single-circuit generator with a water-cooled transmitting tube and which holds an internal or external working circuit, via which the excimer emitter tube is connected to the

generator. The output is hereby coupled into the excimer emitter via water-cooled capacitors and resonant-circuit inductances.

In accordance with the preferred embodiment of the invention, the working circuit connecting the HF generator to the excimer emitter is constructed so that it is located externally and shielded electrically. This externally located and electrically shielded working circuit is then connected to the HF generator via an HF cable. The working circuit itself is thereby in the vicinity of the excimer emitter. The possibility is hereby produced of connecting several excimer emitters to the working circuit.

Another development of the invention consists of also integrating the transmitting tubes into the unit which holds the working circuit. Thus, it is also possible to provision several excimer emitters located in one printing unit or another device of the printing press from one working circuit.

An advantageous development of the invention provides for the inductive resistor in the working circuit, via which the HF generator is connected to the excimer emitter, to be constructed in an adjustable or changeable manner, so that the discharge characteristics of the excimer emitter can be adapted exactly for the entire output range and thus an optimal coupling of the HF output into the barrier discharge of the emitter can be attained. Provision can be made hereby to use an adjustable inductive resistor. Alternatively, it is also possible to use an inductive resistor with several tap possibilities. What is used then is the inductive resistor which produces the best discharging characteristics.

Furthermore, the explanation of an embodiment example of the invention is carried out with the aid of the drawing. This shows the generator, in accordance with the invention, with a working circuit and the excimer emitter connected to it.

An HF generator 1 is constructed, as shown, as a tube generator with a feedback. The output of this HF generator 1 is connected, via an HF cable 2, with the input of a working circuit 3. This working circuit 3 has two capacitors C and, on the output side, an inductive resistor with several taps 4. Two excimer emitters 5 are connected via a contact of the taps 4, wherein the tap 4 is selected, which delivers the desired inductance value of the working circuit 3. The excimer emitters 5 are designed as transmitting tubes, whose structure is known.

The excimer emitters 5 are located in a not-depicted printing press and are used for drying of the stock. The working circuit 3 is assigned to the excimer emitters 5--that is, is located in their vicinity. Via the HF cable 2, a distance of a few meters between the HF generator 1 and the working circuit 3 can be bridged over. Thus, it is possible to set up the HF generator next to the printing press.